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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/518,858	08/11/2005	Hideaki Yamaoka	10921.264USWO	5820

52835 7590 04/26/2007  
HAMRE, SCHUMANN, MUELLER & LARSON, P.C.  
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EXAMINER

SHEN, BIN

ART UNIT PAPER NUMBER

1657

SHORTENED STATUTORY PERIOD OF RESPONSE	MAIL DATE	DELIVERY MODE
3 MONTHS	04/26/2007	PAPER

**Please find below and/or attached an Office communication concerning this application or proceeding.**

If NO period for reply is specified above, the maximum statutory period will apply and will expire 6 MONTHS from the mailing date of this communication.

<b>Office Action Summary</b>	<b>Application No.</b> 10/518,858	<b>Applicant(s)</b> YAMAOKA ET AL.	
	<b>Examiner</b> Bin Shen	<b>Art Unit</b> 1657	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 19 March 2007.
- 2a) ☒ This action is **FINAL**.                      2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 1-3, 5 and 6 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-3, 5-6 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All    b) ☐ Some \* c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- \* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

- |  |   |
|--|---|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892)   | 4) <input type="checkbox"/> Interview Summary (PTO-413)<br>Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)                       | 5) <input type="checkbox"/> Notice of Informal Patent Application                       |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08)<br>Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____  |

Art Unit: 1657

In view of the rewritten claims and the applicant's arguments, the rejections under 35 U.S.C. §112 first and second paragraph, are hereby withdrawn.

In view of the rewritten claims and the applicant's arguments, the rejection under 35 U.S.C. §102 is hereby withdrawn.

***Claim Rejections - 35 USC § 103***

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

Claims 1-3, 5-6 are rejected under 35 U.S.C. 103(a) as being unpatentable over Reiter et al. (Analyst. 2001;126(11):1912-1918), in view of Yum et al. (J Bacteriol. 1997;179(21):6566-6572) and Chen et al. (Anal Chem 2001;73:2862-2868).

Reiter et al. teach a redox reaction with glucose dehydrogenase and Ru compound ( $\text{Ru}(\text{bpy})_2\text{Cl}_2$ , and  $\text{Ru}(\text{bpy})_2\text{CO}_3$ , see abstract), where small aliquots of enzyme solution (read as stimulation in claim 4) have been stepwise added to the reaction, and the response recorded (page 1916, left column, 1<sup>st</sup> full paragraph). Glucose dehydrogenase inherently has three subunits including cytochrome C because Yum et al. teach that all membrane-bound glucose dehydrogenase that have been purified and characterized consist of three subunits, a dehydrogenase ( $\alpha$

Art Unit: 1657

subunit), a cytochrome c and a third component of the lowest molecular weight ( $\gamma$  subunit) (page 6571, left column, 2<sup>nd</sup> full paragraph).

Reiter does not teach that the cytochrome C is derived from burkholderia genus, with a molecular weight of about 43 kDa,  $\alpha$  subunit of glucose dehydrogenase with a molecular weight of about 60 kDa, and  $\gamma$  subunit of glucose dehydrogenase with a molecular weight of about 14 kDa, and Ru compound is a complex represented by  $[\text{Ru}(\text{NH}_3)_5\text{X}]^{n+}$ .

Chen et al. teach a method of measuring glucose concentration using glucose oxidase and  $\text{Ru}(\text{NH}_3)_6^{3+}$  cation and a selected anion, such as  $\text{Ru}(\text{CN})_6^{4-}$ ,  $\text{Fe}(\text{CN})_6^{4-}$ ,  $\text{Co}(\text{CN})_6^{3-}$  or  $\text{IrCl}_6^{3-}$  (abstract).

It would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the method of Reiter by using the Ru compound taught by Chen because Chen teaches that the composite of Ru compound allows for an interference-free determination of glucose, and that the design of the biocomposites is generic and can incorporate oxidoreductase enzymes other than glucose oxidase (such as dehydrogenase) to provide a host of biosensors for biologically and environmentally important analytes (bottom of the abstract and page 2868, Conclusions). One would have been motivated to make the modification because Reiter et al. specifically described the combination of glucose dehydrogenase with Ru complexes and Chen et al. teaches the benefit of using  $[\text{Ru}(\text{NH}_3)_5\text{X}]^{n+}$  as electron carrier, and would reasonably have expected success in view of both Reiter and Chen's teachings. The adjustment of particular conventional working conditions (e.g., specific genus where cytochrome c is derived from, the

Art Unit: 1657

molecular weight of cytochrome c, molecular weight of  $\alpha$  and  $\gamma$  subunits of glucose dehydrogenase) is deemed merely a matter of judicious selection and routine optimization which is well within the purview of the skilled artisan having the cited reference before him/her.

From the teachings of the references, it is apparent that one of ordinary skill in the art would have had a reasonable expectation of success in producing the claimed invention. Therefore, the invention as a whole was *prima facie* obvious to one of ordinary skill in the art at the time the invention was made, as evidenced by the references, especially in the absence of evidence to the contrary.

Applicant's arguments filed 3/19/2007 have been fully considered but they are not persuasive.

Applicant argues that Reiter fails to suggest the method of claim 1 that uses Ru complex as an independent electron carrier that is separate from the enzyme.

It is the examiner's position that Reiter teaches a glucose level measuring method using glucose dehydrogenase as enzyme and Ru complex as electron carrier (abstract), and the choice of separate the enzyme from the electron carrier is deemed routine optimization which is well within the purview of the skilled artisan having the cited reference before him/her if this separation increases the accuracy and shortens the time of the measurement (common criteria for improve any measurement).

**THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

Art Unit: 1657

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

#### **Conclusion**

No claim is allowed.

Certain papers related to this application may be submitted to Art Unit 1657 by facsimile transmission. The faxing of such papers must conform with the notices published in the Official Gazette, 1156 OG 61 (November 16, 1993) and 1157 OG 94 (December 28, 1993) (see 37 C.F.R. § 1.6(d)). The official fax telephone number for the Group is 571-273-8300. NOTE: If Applicant does submit a paper by fax, the original signed copy should be retained by applicant or applicant's representative. NO DUPLICATE COPIES SHOULD BE SUBMITTED so as to avoid the processing of duplicate papers in the Office.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to (571) 272-0547.

Patent applicants with problems or questions regarding electronic images that can be viewed in the Patent Application Information Retrieval system (PAIR) can now contact the USPTO's Patent Electronic Business Center (Patent EBC) for assistance.

Art Unit: 1657

Representatives are available to answer your questions daily from 6 am to midnight (EST). The toll free number is (866) 217-9197. When calling please have your application serial or patent number, the type of document you are having an image problem with, the number of pages and the specific nature of the problem. The Patent Electronic Business Center will notify applicants of the resolution of the problem within 5-7 business days. Applicants can also check PAIR to confirm that the problem has been corrected. The USPTO's Patent Electronic Business Center is a complete service center supporting all patent business on the Internet. The USPTO's PAIR system provides Internet-based access to patent application status and history information. It also enables applicants to view the scanned images of their own application file folder(s) as well as general patent information available to the public.

For all other customer support, please call the USPTO Call Center (UCC) at 800-786-9199.

Any inquiry concerning rejections or objections in this communication or earlier communications from the examiner should be directed to Bin Shen, Ph.D., whose telephone number is (571) 272-9040. The examiner can normally be reached on Monday through Friday, from about 9:00 AM to about 5:30 PM. A phone message left at this number will be responded to as soon as possible (i.e., shortly after the examiner returns to her office).

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Dr. Jon Weber can be reached at (571) 272-0925.

*B Shen*

Art Unit 1657



RALPH GITOMER  
PRIMARY EXAMINER  
GROUP 1200